

WHAT IS CLAIMED IS:

1. A redundant structure control device for an exchange having a spare line interface device, comprising

frame tag attaching means for attaching a routing header
5 to a frame coming in from lines or line interface devices and giving tag information in said routing header,

frame switching means for switching a destination of said frame to which tag information has been given, in accordance with said tag information,

10 routing control means for monitoring states of said line interface devices, and when trouble happens at one of said line interface devices, sending out a control signal to said frame tag attaching means so that a frame coming from a line originally connected with said line interface device at which trouble has
15 happened may be switched over to said spare line interface device, and arranging said frame tag attaching means so that a frame coming from said spare line interface device may flow to said line originally connected with said line interface device at which trouble has happened.

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2. A redundant structure control device for an exchange according to claim 1, wherein a device arranged between an asynchronous transmission mode switch and said line interface devices, for delivering cells coming from said asynchronous
25 transmission mode switch toward said line interface devices, one by one, in accordance with tag information given to each of said cells, to said line interface devices includes tag changing means

for changing a value of a tag of a cell indicating that the cell should be sent from said asynchronous transmission mode switch to a line interface device at which trouble has happened, to a value indicating that the cell should be routed to said spare
5 line interface device, in accordance with instructions from said routing means.

3. A redundant structure control device for an exchange according to claim 2, wherein said spare line interface
10 device includes memory means for storing path information for all line interface devices for current use, and path-information placing means for reading path information for a line interface device at which trouble has happened from said memory means and placing said path information in position, in accordance with
15 instructions from said routing control means.

4. A redundant structure control device for an exchange according to claim 2, wherein said spare line interface device has the same structure as each line interface device for
20 current use has, and a call processor is arranged to transfer path information stored in a line interface device at which trouble has happened to said spare line interface device.

5. A redundant structure control device for an
25 exchange having a spare line, comprising
frame tag attaching means for attaching a routing header to a frame coming in from lines or line interface devices and

giving tag information in said routing header,

frame switching means for switching a destination of said frame to which tag information has been given, in accordance with said tag information,

5 line trouble monitoring means arranged between said lines and said frame switching means, for monitoring line trouble, and

routing control means for identifying, based on line trouble information from said line trouble monitoring means, a
10 line interface device connected with a line at which trouble has happened, and arranging said frame tag attaching means so that a frame coming from said identified line interface device towards said line at which trouble has happened may be sent out to said spare line.

15 6. A redundant structure control device for an exchange having a set of a spare line and a spare line interface device, comprising

frame tag attaching means for attaching a routing header
20 to a frame coming in from lines or line interface devices and giving tag information in said routing header,

frame switching means for switching a destination of said frame to which tag information has been given, in accordance with said tag information,

25 line trouble monitoring means arranged between said lines and said frame switching means, for monitoring line trouble,

routing control means for monitoring states of said

line interface devices, and when trouble happens at one of said line interface devices, sending out a control signal to said frame tag attaching means so that a frame coming from a line originally connected with said line interface device at which trouble has happened may be switched over to said spare line interface device, and arranging said frame tag attaching means so that a frame coming from said spare line interface device may flow to said line originally connected with said line interface device at which trouble has happened; and identifying, based on line trouble information from said line trouble monitoring means, a line interface device connected with a line at which trouble has happened, and arranging said frame tag attaching means so that a frame coming from said identified line interface device towards said line at which trouble has happened may be sent out to said spare line, and

tag changing means provided in an asynchronous transmission mode concentrator arranged between said line interface devices and an asynchronous transmission mode switch, for changing a value of a tag of a cell indicating that the cell should be sent from said asynchronous transmission mode switch to a line interface device at which trouble has happened, to a value indicating that the cell should be routed to said spare line interface device, in accordance with instructions provided by said routing means when said routing means detects trouble happening at one of said line interface devices.

7. A method of controlling a redundant structure for

an exchange having a set of a spare line and a spare line interface device, comprising

- a step of attaching a routing header to a frame coming in from lines or line interface devices, and giving tag information
- 5 in said routing header, and

- a step of switching a destination of said frame to which tag information has been given, in accordance with said tag information, on a line basis.